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and the chord FE passes through P , and so for any circle.

Q. E. D.

This problem was also solved by *G. B. M. Zerr, John B. Faught, J. F. W. Scheffer, and O. W. Anthony.*

PROBLEMS.

37. Proposed by **B. F. BURLESON**, Oneida Castle, New York.

Inscribe in a semicircle a rectangle having a given area; a rectangle having the maximum area.

38. Proposed by **LEONARD E. DICKSON**, M. A., Fellow in Mathematics, University of Chicago.

Give a *strictly geometric* proof of my fundamental theorem on the Inscription of Regular Polygons, viz: Suppose a circle of unit radius divided at the points $A, A_1, A_2, A_3, \dots, A_p, \dots$ into $2p+1$ equal parts and the diameter AO drawn. Then, if the chords OA_1, OA_2, \dots, OA_p be drawn, we have $OA_1 - OA_2 + OA_3 - OA_4 + OA_5 - \dots \pm OA_p = 1$.

CALCULUS.

Conducted by **J. M. COLAW**, Monterey, Va. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

25. Proposed by **F. P. MATZ**, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

A leaf of the curve: "The Devil on Two Sticks", equation $y^4 - x^4 + 100a^2x^2 - 96a^2y^2 = 0$, revolves around the axis of x . Deduce the expression for the volume generated.

I. Solution by the PROPOSER.

From the equation of the given curve, we deduce $y^2 = 48a^2 \pm \sqrt{(2304a^4 - 100a^2x^2 + x^4)} \dots (1)$; that is, $(PD)^2 = 48a^2 + \sqrt{(2304a^4 - 100a^2x^2 + x^4)}$, and, therefore, $(P'D)^2 = 48a^2 - \sqrt{(2304a^4 - 100a^2x^2 + x^4)}$. Hence the expression for the volume generated after the curve has made a complete revolution around the axis of x , becomes

$$V = 2\pi \left[\int_0^{6a} [48a^2 + \sqrt{(2304a^4 - 100a^2x^2 + x^4)}] dx - \int_0^{6a} [48a^2 - \sqrt{(2304a^4 - 100a^2x^2 + x^4)}] dx \right] \dots (2).$$